1075-92-118 **Brittany E. Bannish*** (bannish@math.utah.edu), **Aaron L. Fogelson** and **James P. Keener**. *A stochastic multiscale model of fibrinolysis.*

The degradation of blood clots is a tightly regulated process. If the mesh of fibrin fibers securing the clot degrades too slowly, thrombi can form, leading to heart attack or stroke. If the fibrin degrades too quickly, excessive bleeding may occur. We study fibrinolysis (the degradation of fibrin by the main fibrinolytic enzyme, plasmin) using a multiscale mathematical model intended to answer the following question: Why do coarse clots composed of thick fibers lyse more quickly than fine clots composed of thin fibers, despite the fact that individual thin fibers lyse more quickly than individual thick fibers? We use stochastic methods to model lytic processes on scales ranging from individual fiber cross section to whole clot. We find that while fiber number does have an effect on lysis rate, it is not simply "fewer fibers equals faster lysis", as many biologists suggest. We discuss the additional determinants of lysis speed, as well as how patterns and speeds of lysis (both on an individual fiber and clot scale) vary under a range of conditions. This last point is of particular interest for development of treatments for occlusive blood clots. Our model predicts potential targets for future research on effective therapeutic strategies for degrading blood clots. (Received August 25, 2011)